

### **DETAILED ACTION**

Applicant's arguments filed 5/11/11 have been fully considered but they are not persuasive. Previous rejections and objections not addressed below are withdrawn.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 135-151 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodenough (3,558,503; 1/26/07) in view of Dallmier and McKinnie declaration.

Goodenough teaches a method of producing an aqueous solution having bromine values of about 0.01 to about 100,000 ppmw useful for bleaching processes, treating swimming pools and disinfecting processes (column 1 lines 13-61). Goodenough teaches a method of producing an aqueous bromine solution comprising providing an aqueous solution of bromine and contacting therewith a bromine stabilizer such as sulfamic acid plus an amount of hydroxide such as magnesium hydroxide sufficient to achieve a final pH ranging from about 8 to about 10 (column 2 lines 1-40). Note, the mixing of magnesium hydroxide with sulfamic acid result in an alkaline metal salt of sulfamic acid which is functionally equivalent to the instant alkali metal salt (sodium) of sulfamic acid.

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According to Moore's own expert, Dr. McKinnie, the reaction taught in Goodenough would be exothermic. Goodenough also teaches that the molar ratio of bromine to nitrogen ( $\text{Br}_2:\text{N}_2$ ) ranges from about 2 to about 0.5, which would have indicated to an artisan that the atomic ratio of nitrogen to active bromine ( $\text{N}:\text{Br}$ ) ranges from about 0.5 to about 2 (column 1 lines 66-69).

Goodenough's method of making a final solution having a bromine content of about 100,000 ppmw differs from the method recited in Moore's claim 61 in the pH of the resulting biocide composition. That is, Goodenough's method yields a biocide having a pH of from about 8 to about 10 (Example 3) whereas Moore's claimed method yields in a biocide having a pH ranging from 12.0 to 14.0. Thus, as pointed out by Moore, "the question is whether the prior art provided that motivation to modify the method of Goodenough with a reasonable expectation of success". The record indicates that the answer is affirming.

Dallmier discloses a process that "improves on the Goodenough et al. reference by means of a safer, easier, and more economical process." (column 2 lines 45-47). As confirmed by Moore's own expert, Dallmier suggests that a sulfamic acid stabilized hypobromite such as N-bromosulfamate can be stored in a high pH solution ranging from about 8 to about 14 and more preferably from about 11 to about 14 with minimal suspected carcinogen bromate formation. (column 3 lines 28-3; column 4 lines 47-49; column 9 line 65 – column 10 line 60). As taught by Dallmier, the formation of bromate occurs from a reaction involving hypobromite as a reactant and stabilized hypobromite (column 3 lines 24-26; column 10 lines 1-8).

Hence, an artisan would have been motivated to combine the teachings of Goodenough and Dallmier. It would have been obvious to modify Goodenough's process to include a step of increasing the pH of the final solution to 12-14 as indicated in Dallmier in order to minimize the formation of the suspected carcinogen bromate during storage, thus arriving at a method encompassed by Moore's claims 61-65.

The subject matter of Moore's claim 64 is made obvious in view of the prior art. Claim 64 recites an active bromine content of "at least about 100,000 PPM (wt/wt)" and an atomic ratio of nitrogen to active bromine of "greater than 1," which is made obvious over the prior art, because the prior art ranges overlap the claimed ranges.

*Response to Applicants' argument*

Applicants point out that the instant claims employ bromine, not bromine chloride or bromine and chlorine. Applicants argue that McKinnie does not use bromine as the bromine source as claimed. Goodenough and Dallmier differ in bromine source. Applicants argue that McKinnie compares the amounts of N-bromosulfamate and N-chlorosulfamate produced when using bromine chlorine versus bromine and chlorine. Applicants point out that Goodenough uses bromine and Dallmier uses bromide salts. The Examiner argues that claims employ consisting essentially of language which allows for the inclusion of other bromine sources such as bromide salts, bromine chloride or bromine and chlorine. The consisting essentially of language would only exclude bromide salts, bromine chloride or bromine and chlorine as bromine sources if neither

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source would materially impact the invention. The art cited, demonstrates that bromide salt, bromine or bromine chloride or bromine and chlorine is used to form biocides when combined with sulfamic acid and base. All bromine sources yield a composition that functions as a biocide when combined with base and sulfamic acid. Thus, the bromine source does not alter the functional utility of the composition.

The Applicants maintains that Goodenough and Dallmier disclose incompatible processes for forming halogen-based biocidal solutions. In Goodenough addition steps are not critical. In Goodenough, the halogen is added to the solution second or last. On the other, Dallmier discloses that the addition steps are critical. In Dallmier, the halogen is added first. In both Dallmier and Goodenough the base is added last to attain their wanted pH. Dallmier teaches that the base should be added last and supports that it is unfavorable to conduct processes for formation of the biocide at elevated pH values. The Examiner argues that no data have been provided by the Applicants with respect to the significance of the instant ordering of steps in the formation of the liquid biocide.

Applicants argue that the combination of Goodenough and Dallmier does not render obvious a method wherein the pH is at an elevated value at all times during the process. The Applicants alert the Examiner that the present claims use "consisting of" or "consisting essentially of" language which exclude an additional step at the end of the process wherein base is added to reach a pH of about 12 to about 14. The Examiner argues that the consisting essentially of

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language does not necessarily exclude an additional method step, i.e. a step of increasing the pH in a range of 12 to 14 at the end of the process. An Artisan in the field reading Dallmier would have been motivated to modify the invention of Goodenough such that the pH in Goodenough would range from 12 to 14. The Artisan would have been expected to do this in order to reduce the formation of bromate, a carcinogen compound.

Applicants argue the Goodenough reference and Dallmier reference are inconsistently used in the rejection. The process in Dallmier differ from the process in Goodenough, i.e. Dallmier 1) does not enhance the process in Goodenough, 2) points out the deficiencies in the Goodeoungh, 3) discards the Goodenough process and 4) provides a different replacement process for the Goodenough process. Applicants argue that a study of Dallmier shows that Dallmier regards Goodenough process to be hazardous due to the use of diatomic halogen and the bromate formation as a suspected carcinogen. Thus, it is improper to employ Dallmier for its teaching that the pH of the final solution is 12-14. The Examiner maintains that it is obvious to combine Goodenough and Dallmier to arrive at the rejection of record. Thus, the references combined are not insistentlly used in the rejection of record. Note, the Examiner points out that both Goodenough and Dallmier are drawn to biocides containing a bromine source, sulfamic acid and base. Thus, the combination of the references is obvious since both references individually are drawn to biocides containing the same chemical components. In addition, Dallmier does improve on Goodenough by noting that an increase in pH reduces the production of bromate, a well known

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carcinogen. Such a notation in Dallmier would lead an artisan in the field to raise the pH of the solution in Goodenough to reduce the production of carcinogenic agents such as bromate. The Examiner argues that Dallmier is used to avoid the formation of bromate(carcinogen) by raising the pH of the solution in Goodenough to reach 12-14.

Dr. Nalepa's Declaration does not provide data comparing the instant invention to Goodenough's invention.

***Allowable Subject Matter***

The prior art does not teach or suggest the closed process (i.e., the process consist of ...) in claims 131-134.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Telephonic Inquiry***

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALTON N. PRYOR whose telephone number is (571)272-0621. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alton N. Pryor/  
Primary Examiner, Art Unit 1616